CYBEREX®

Cyberex® Industrial Power Conditioning

In this section...

Cyberex® Industrial Power Conditioning

UL®/NEMA Industrial UPS Systems..... H-568–H-582
IEC Industrial UPS Systems..... H-583–H-585
Float Battery Chargers..... H-586–H-590
Standalone Inverter Systems..... H-591–H-592
Standalone Digital Static Transfer Switches..... H-593–H-594
Power Distribution Systems..... H-595–H-596

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UL®/NEMA Industrial UPS Systems

CyberWave UPS — 10kVA/8kW, 15kVA/12kW, 20kVA/16kW

CyberWave UPS, the world's first digitally controlled UPS for custom industrial applications, combines Cyberex's hallmark rugged electrical design with the versatility of digital signal processors, field-programmable gate arrays and EPROMs to set a new standard in UPS performance and reliability. CyberWave UPS has standard features no other UPS manufacturer can match, including Modbus communications, advanced battery management capabilities and the world's first VGA, full-color touch screen 8" x 11" control panel (PowerPad). In addition, every CyberWave UPS incorporates Cyberex's Digital Static Transfer Switch design for increased system redundancy and reliability.

Features

- IGBT-based PWM inverter
- Digital Signal Processing (DSP)
- Fiber optic datapaths
- Full-color touch screen monitor panel
- Full isolation – input/output transformers
- Industrial-grade frame/cabinet
- Fully rated static switch
- Maintenance bypass switch
- Modbus communications
- RS-232 communications port
- Meets NEMA/UL® 1778 standard

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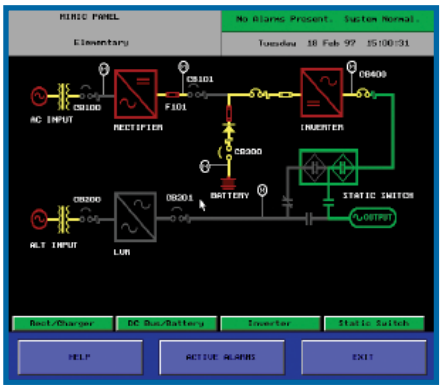
UL®/NEMA Industrial UPS Systems

Mimic Display



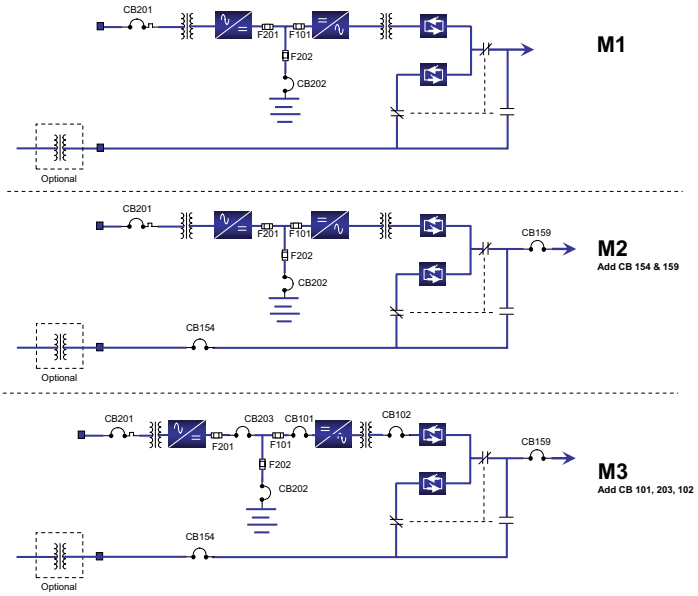
UPS Module

Circuit Breakers/Fuse Sizes

	10kVA/8KW	15kVA/12KW	20kVA/16kW
CB 201 – AF/AT			
208V	125AF/80AT	125AF/125AT	150AF/250AT
480V	125AF/35AT	125AF/50AT	125AF/80AT
F 101, 201, 202 – Rating (A)			
120VDC	150A	250A	300A
240VDC	80A	125A	150A
CB 102, 154, 159 – Rating (AF)			
120VAC	125A	250A	250A
CB 202, 203, 101 – Rating (AF)			
120VDC	125A	250A	250A

Inverter

Hardware Configuration



Isolation Transformer

UL®/NEMA Industrial UPS Systems

Product Specifications

AC Input	
Input Voltage	480VAC, 3W+G 208VAC, 3W+G
Max. Input Current @ Rated Load (Nominal VAC)	
(10kVA/8kW)	21A @ 480VAC–49A @ 208VAC
(15kVA/12kW)	32A @ 480VAC–74A @ 208VAC
(20kVA/16kW)	43A @ 480VAC–99A @ 208VAC
Input Voltage Range	+10, -20% VAC from Nominal
Input Power Factor	.75 @ Full Load and Nominal
Current Walk-In	Up to Full Load in 15 Seconds
Surge Withstand	Meets IEEE 587/ANSI C62.41
Input Current THD%	30% Typical, 10% with Optional Input Filter
DC Bus/Battery	
DC Voltage (Nominal)	120VDC (60 Cells Nominal) 240VDC (120 Cells Nominal)
DC Range	105–140VDC–210–280VDC
DC Regulation	±.25% from 0 to 100% Load
DC Ripple	< 2% RMS Ripple @ 100% Load with Battery Connected
DC-AC Efficiency	88% (Typical)
DC End Volts	1.75V/Cell End Volts
Environmental	
Acoustical Noise Level	< 60 dBA @ 3 Feet
Operating Temperature	0–40° C
Relative Humidity	0–95% Non-Condensing
Access	No Rear or Side Access Required for Operations or Maintenance
AC Efficiency	Typical 83% (kW out/kW in)
Cooling	Forced Air (in front/out top)
Heat Rejection	
(10 kVA/8 kW)	4200 BTU/hr.
(15 kVA/16 kW)	5600 BTU/hr.
(20 kVA/16 kW)	7460 BTU/hr.
Operating Altitude	Up to 1000m w/o Derating Load
AC Output	
Output Voltage	120V (other voltages available; contact factory)
Output Current (Nominal)	
(10kVA/8kW)	83A @ 120VAC
(15kVA/16kW)	125A @ 120VAC
(20kVA/16kW)	167A @ 120VAC
Voltage Regulation	<±.5% Steady State for 0 to 100% Load Change
Transient Response	<± 5% for a 100% Load Step <± 1% for a Loss/Return AC Input Power <± 5% for Manual Transfer to Bypass and Back, 100% Load <± 5% for a 100% Load Step
Recovery	Return to within ± 2.5% of Nominal within 16 msec
Voltage Distortion	Linear Loads: <± 3.5% @ 100% Load
Overload	Up to 150% for 15 Min.
Overload Static Bypass	>1000% for 1 Cycle
Frequency	60 Hz (50 Hz Optional)
Frequency Stability	±.1% Free Running
Frequency Slew Rate	1.0 Hz/Sec. Maximum
Weight	
M1, M2	1,600 lb. (726 kg)
M3	2,100 lb. (953 kg)

Metering

Three Options: PowerPad 1, PowerPad 2 and PowerPad 3

Metering Value (1% Accurate)

	Metering Features	PowerPad 1	PowerPad 2	PowerPad 3
Rectifier	Input Voltage (All Phase)	✔	✔	✔
	Input Current (All Phase)	✔	✔	✔
	Input Frequency		✔	✔
	Output Voltage (VDC)		✔	✔
	Output Current		✔	✔
Battery	Voltage (VDC)	✔	✔	✔
	Current	✔	✔	✔
	Runtime		✔	✔
	Time Remaining		✔	✔
	Power		✔	✔
	Cycles			✔
	Total Cycles			✔
	Test Cycles			✔
Inverter	Voltage (RMS)		✔	✔
	Current (RMS)		✔	✔
	Frequency		✔	✔
	Input Voltage (VDC)	Optional	Optional	Optional
Output	Voltage (RMS)	✔	✔	✔
	Current (RMS)	✔	✔	✔
	Frequency	✔	✔	✔
	Real Power (W)		✔	✔
	Apparent Power (VA)		✔	✔
	% Loading		✔	✔
	Crest Factor			✔
	Peak Current			✔
	Power Factor			✔
Alternate Line	Input Voltage	✔	✔	✔
	Input Frequency	✔	✔	✔

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- Digital Signal Processing (DSP)
- Fiber optic datapaths
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- Full isolation – input/output transformers
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- Fully rated static switch
- Maintenance bypass switch
- Modbus communications
- RS-232 communications port
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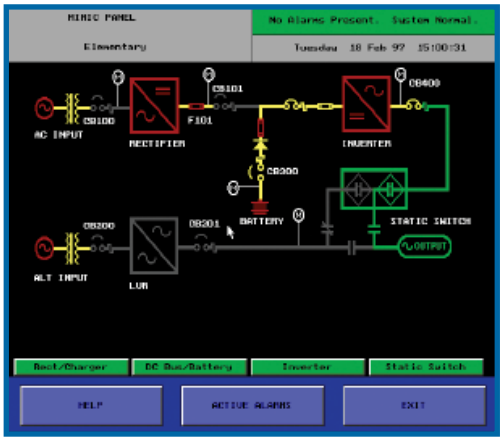
UL®/NEMA Industrial UPS Systems

Mimic Display



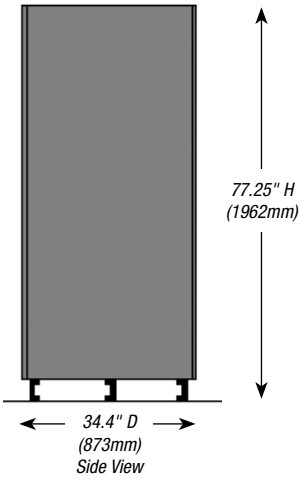
Circuit Breakers/Fuse Sizes

	25kVA/20kW	30kVA/24kW
CB 201 – AF/AT		
208V	250 AF/200 AT	225 AF/250 AT
480V	125 AF/80 AT	125 AF/90 AT
F 101, 201, 202 – Rating (A)		
120VDC	400A	500A
240VDC	200A	250A
CB 102, 154, 159 – Rating (AF)		
120VAC	400A	400A
CB 202, 203, 101 – Rating (AF)		
120VDC	400A	400A

UPS Module

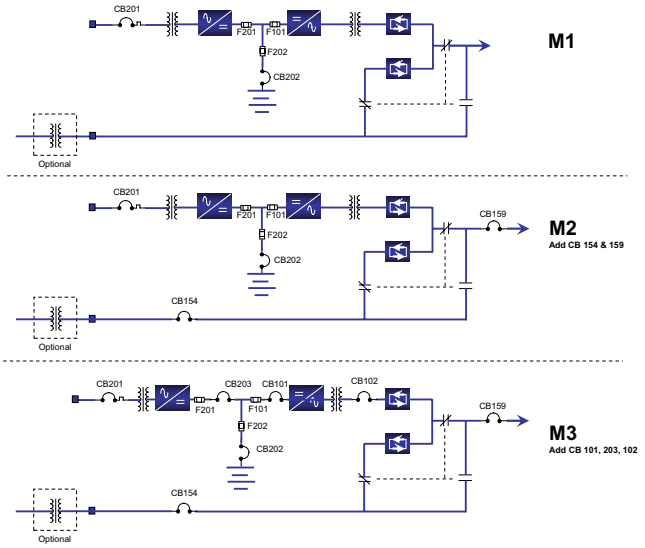
M1

M2 *(Not shown), 74" W (1880mm)*



Side View

Hardware Configuration



Inverter

Isolation Transformer

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UL®/NEMA Industrial UPS Systems

Product Specifications

AC Input		
Input Voltage	480VAC, 3W+G 208VAC, 3W+G	
Max. Input Current @ Rated Load (Nominal VAC)		
(25kVA/20kW)	53A @ 480VAC–123A @ 208VAC	
(30kVA/24kW)	43A @ 480VAC–148A @ 208VAC	
Input Voltage Range	+10, -20% VAC from Nominal	
Input Power Factor	.75 @ Full Load and Nominal	
Current Walk-In	Up to Full Load in 15 Seconds	
Surge Withstand	Meets IEEE 587/ANSI C62.41	
Input Current THD%	30% Typical, 10% with Optional Input Filter	
DC Bus/Battery		
DC Voltage (Nominal)	120VDC (60 Cells Nominal) 240VDC (120 Cells Nominal)	
DC Range	105–140VDC–210–280VDC	
DC Regulation	±.25% from 0 to 100% Load	
DC Ripple	< 2% RMS Ripple @ 100% Load with Battery Connected	
DC-AC Efficiency	88% (Typical)	
DC End Volts	1.75V/Cell End Volts	
Environmental		
Acoustical Noise Level	< 60 dBA @ 3 Feet	
Operating Temperature	0–40° C	
Relative Humidity	0–95% Non-Condensing	
Access	No Rear or Side Access Required for Operations or Maintenance	
AC Efficiency	Typical 83% (kW out/kW in)	
Cooling	Forced Air (in front/out top)	
Heat Rejection		
(25kVA/20kW)	12,050 BTU/hr.	
(30kVA/24kW)	19,320 BTU/hr.	
Operating Altitude	Up to 1000m without Derating Load	
AC Output		
Output Voltage	120V (other voltages available; contact factory)	
Output Current (Nominal)		
(25kVA/20kW)	208A @ 120VAC	
(30kVA/24kW)	250A @ 120VAC	
Voltage Regulation	<±.5% Steady State for 0 to 100% Load Change	
Transient Response	<± 5% for a 100% Load Step <± 1% for a Loss/Return AC Input Power	
	<± 5% for Manual Transfer to Bypass and Back, 100% Load	
	<± 5% for a 100% Load Step	
Recovery	Return to within ± 2.5% of Nominal within 16 msec	
Voltage Distortion	Linear Loads: <± 3.5% @ 100% Load	
Overload	Up to 150% for 15 Min.	
Overload Static Bypass	>1000% for 1 Cycle	
Frequency	60 Hz (50 Hz Optional)	
Frequency Stability	±.1% Free Running	
Frequency Slew Rate	1.0 Hz/Sec. Maximum	
Weight	***25kVA***	***30kVA***
M1	2,300 lb. (1,043kg)	2,590 lb. (1,175kg)
M2	2,560 lb. (1,161kg)	2,850 lb. (1,293kg)
M3	2,620 lb. (1,188kg)	2,910 lb. (1,320kg)

Metering

Three Options: PowerPad 1, PowerPad 2 and PowerPad 3 Metering Value (1% Accurate)

	Metering Features	PowerPad 1	PowerPad 2	PowerPad 3
Rectifier	Input Voltage (All Phase)	✔	✔	✔
	Input Current (All Phase)	✔	✔	✔
	Input Frequency		✔	✔
	Output Voltage (VDC)		✔	✔
	Output Current		✔	✔
Battery	Voltage (VDC)	✔	✔	✔
	Current	✔	✔	✔
	Runtime		✔	✔
	Time Remaining		✔	✔
	Power		✔	✔
	Cycles			✔
	Total Cycles			✔
	Test Cycles			✔
Inverter	Voltage (RMS)		✔	✔
	Current (RMS)		✔	✔
	Frequency		✔	✔
	Input Voltage (VDC)	Optional	Optional	Optional
Output	Voltage (RMS)	✔	✔	✔
	Current (RMS)	✔	✔	✔
	Frequency	✔	✔	✔
	Real Power (W)		✔	✔
	Apparent Power (VA)		✔	✔
	% Loading		✔	✔
	Crest Factor			✔
	Peak Current			✔
	Power Factor			✔
Alternate Line	Input Voltage	✔	✔	✔
	Input Frequency	✔	✔	✔

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UL®/NEMA Industrial UPS Systems

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Features

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- Industrial-grade frame/cabinet
- Fully rated static switch
- Maintenance bypass switch
- Modbus communications
- RS-232 communications port
- Meets NEMA/UL® 1778 standard

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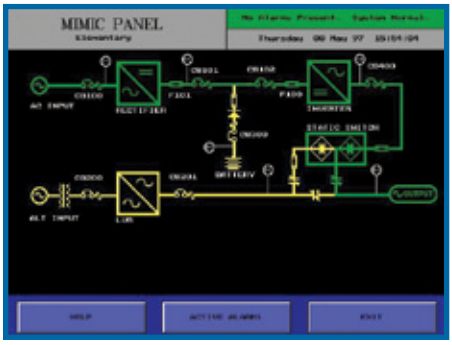
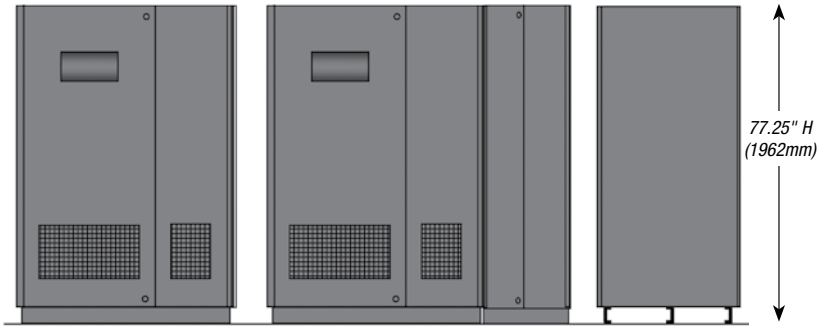
Mimic Display



UPS Module



55" W (1397mm)
M1

80" W (2032mm)
M2
M3 (Not Shown) 92" W (2370mm)

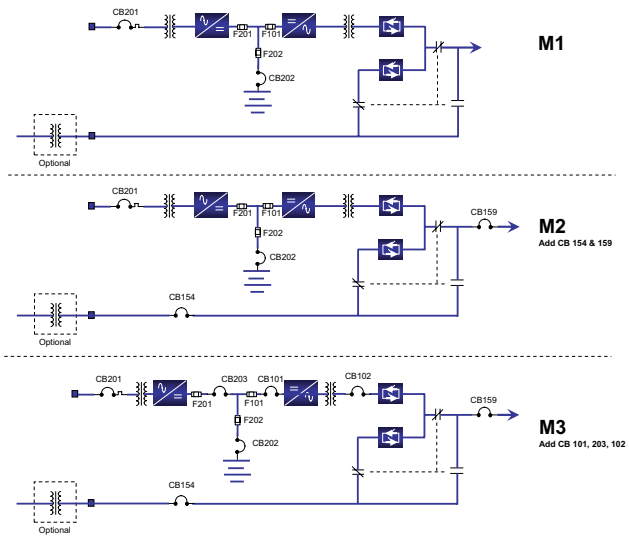
34.4" D
(873mm)
Side View

Circuit Breakers/Fuse Sizes

	40KVA/32KW	50KVA/40KW	60KVA/48KW
CB 201 – AF/AT			
208V	400AF/300AT	400AF/350AT	600AF/450AT
480V	125AF/125AT	250AF/150AT	250AF/175AT
F 101, 201, 202 – Rating (A)			
120VDC	600A	800A	800A
240VDC	300A	400A	500A
CB 102, 154, 159 – Rating (AF)			
120VAC	400A	600A	600A
CB 202, 203, 101 – Rating (AF)			
120VDC	600A	600A	600A

Inverter

Hardware Configuration



Isolation Transformer

UL®/NEMA Industrial UPS Systems

Product Specifications

AC Input	
Input Voltage	480VAC, 3W+G 208VAC, 3W+G
Max. Input Current @ Rated Load (Nominal VAC)	
(40kVA/32kW)	80A @ 480VAC–197A @ 208VAC
(50kVA/40kW)	107A @ 480VAC–247A @ 208VAC
(60kVA/48kW)	128A @ 480VAC–296A @ 208VAC
Input Voltage Range	+10, -20% VAC from Nominal
Input Power Factor	.75 @ Full Load and Nominal
Current Walk-In	Up to Full Load in 15 Seconds
Surge Withstand	Meets IEEE 587/ANSI C62.41
Input Current THD%	30% Typical, 10% with Optional Input Filter
DC Bus/Battery	
DC Voltage (Nominal)	120VDC (60 Cells Nominal) 240VDC (120 Cells Nominal)
DC Range	105–140VDC–210–280VDC
DC Regulation	±.25% from 0 to 100% Load
DC Ripple	< 2% RMS Ripple @ 100% Load with Battery Connected
DC-AC Efficiency	88% (Typical)
DC End Volts	1.75V/Cell End Volts
Environmental	
Acoustical Noise Level	< 60 dBA @ 3 Feet
Operating Temperature	0–40° C
Relative Humidity	0–95% Non-Condensing
Access	No Rear or Side Access Required for Operations or Maintenance
AC Efficiency	Typical 83% (kW out/kW in)
Cooling	Forced Air (in front/out top)
Heat Rejection	
(40 kVA / 32 kW)	19,320 BTU/hr.
(50 kVA / 40 kW)	24,196 BTU/hr
(60 kVA / 48 kW)	28,918 BTU/hr
Operating Altitude	Up to 1000m without Derating Load
AC Output	
Output Voltages	120V (other voltages available; contact factory)
Output Current (Nominal)	
(40kVA/32kW)	250A @ 120VAC
(50kVA/40kW)	417A @ 120VAC
(60kVA/48kW)	500A @ 120VAC
Voltage Regulation	<± .5% Steady State for 0 to 100% Load Change
Transient Response	<± 5% for a 100% Load Step <± 1% for a Loss/Return AC Input Power <± 5% for Manual Transfer to Bypass and Back, 100% Load <± 5% for a 100% Load Step
Recovery	Return to within ± 2.5% of Nominal within 16 msec
Voltage Distortion	Linear Loads: <± 3.5% @ 100% Load
Overload	Up to 150% for 15 Min.
Overload Static Bypass	>1000% for 1 Cycle
Frequency	60 Hz (50 Hz Optional)
Frequency Stability	± .1% Free Running
Frequency Slew Rate	1.0 Hz/Sec. Maximum

Weight		
40kVA		
M1	240V – 2,700 lbs. (1,225kg)	120V – 2,500 lbs. (1,134kg)
M2	240V – 2,700 lbs. (1,225kg)	120V – 2,900 lbs. (1,315kg)
M3	240V – 3,500 lbs. (1,588kg)	120V – 2,900 lbs. (1,315kg)
50kVA		
M1	240V – 3,200 lbs. (1,451kg)	120V – 2,800 lbs. (1,270kg)
M2	240V – 3,200 lbs. (1,451kg)	120V – 3,200 lbs. (1,451kg)
M3	240V – 3,800 lbs. (1,723kg)	120V – 3,200 lbs. (1,451kg)
60kVA		
M1	240V – 3,500 lbs. (1,588kg)	120V – 3,200 lbs. (1,451kg)
M2	240V – 3,500 lbs. (1,588kg)	120V – 3,500 lbs. (1,588kg)
M3	240V – 4,200 lbs. (1,905kg)	120V – 3,500 lbs. (1,588kg)

Metering

THREE OPTIONS: POWERPAD 1, POWERPAD 2 AND POWERPAD 3 METERING VALUE (1% ACCURATE)

	METERING FEATURES	POWERPAD 1	POWERPAD 2	POWERPAD 3
Rectifier	Input Voltage (All Phase)	✔	✔	✔
	Input Current (All Phase)	✔	✔	✔
	Input Frequency		✔	✔
	Output Voltage (VDC)		✔	✔
	Output Current		✔	✔
Battery	Voltage (VDC)	✔	✔	✔
	Current	✔	✔	✔
	Runtime		✔	✔
	Time Remaining		✔	✔
	Power		✔	✔
	Cycles			✔
	Total Cycles			✔
	Test Cycles			✔
Inverter	Voltage (RMS)		✔	✔
	Current (RMS)		✔	✔
	Frequency		✔	✔
	Input Voltage (VDC)	Optional	Optional	Optional
Output	Voltage (RMS)	✔	✔	✔
	Current (RMS)	✔	✔	✔
	Frequency	✔	✔	✔
	Real Power (W)		✔	✔
	Apparent Power (VA)		✔	✔
	% Loading		✔	✔
	Crest Factor			✔
	Peak Current			✔
	Power Factor			✔
Alternate Line	Input Voltage	✔	✔	✔
	Input Frequency	✔	✔	✔

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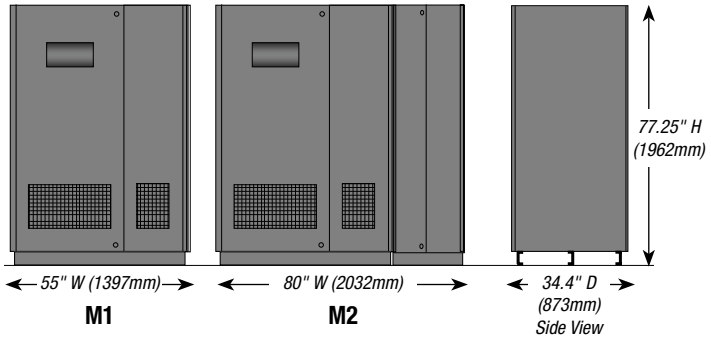
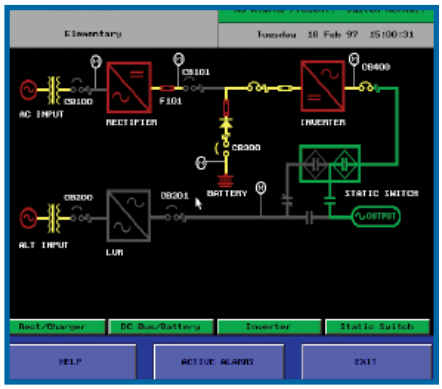
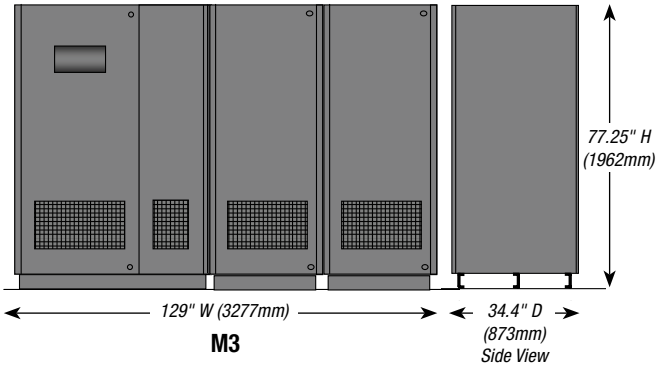
UL®/NEMA Industrial UPS Systems

UPS Module

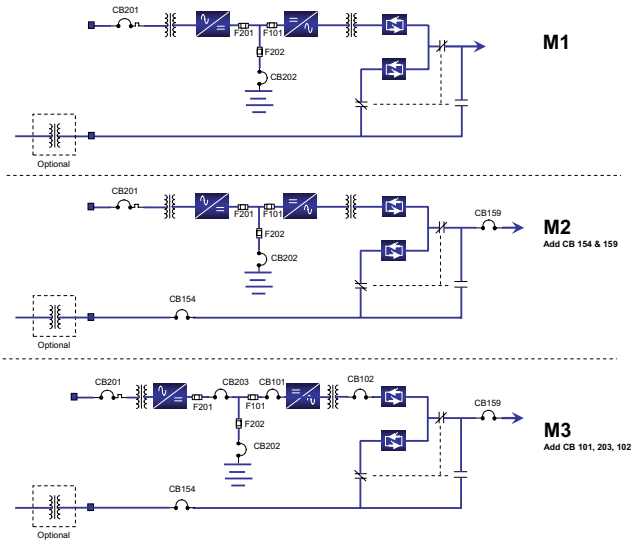


Mimic Display





Hardware Configuration



Inverter

Isolation Transformer

Circuit Breakers/Fuse Sizes

	75kVA/60kW	112.5kVA/90kW
CB 201 – AF/AT		
208V	600AF/600AT	1200 AF/900 AT
480V	250AF/250AT	400 AF/400 AT
F 101, 201, 202 – Rating (A)		
240VDC	500A	800A
CB 102, 154, 159 – Rating (AF)		
120VAC	800A	1200A
CB 202, 203, 101 – Rating (AF)		
240VDC	400A	600A

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UL®/NEMA Industrial UPS Systems

Product Specifications

AC Input		
Input Voltage	480VAC, 3W+G 208VAC, 3W+G	
Max Input Current @ Rated Load (Nominal VAC)		
(75kVA/60kW)	160A @ 480VAC–370A @ 208VAC	
(112.5kVA/90kW)	239A @ 480VAC–553A @ 208VAC	
Input Voltage Range	+10, -20% VAC from Nominal	
Input Power Factor	.75 @ Full Load and Nominal	
Current Walk-In	Up to Full Load in 15 Seconds	
Surge Withstand	Meets IEEE 587/ANSI C62.41	
Input Current THD%	30% Typical, 10% with Optional Input Filter	
DC Bus/Battery		
DC Voltage (Nominal)	240VDC (120 Cells Nominal)	
DC Range	105–140VDC–210–280VDC	
DC Regulation	±.25% from 0 to 100% Load	
DC Ripple	< 2% RMS Ripple @ 100% Load with Battery Connected	
DC-AC Efficiency	88% (Typical)	
DC End Volts	1.75V/Cell End Volts	
Environmental		
Acoustical Noise Level	< 60 dBA @ 3 Feet	
Operating Temperature	0–40° C	
Relative Humidity	0–95% Non-Condensing	
Access	No Rear or Side Access Required for Operations or Maintenance	
AC Efficiency	Typical 83% (kW out/kW in)	
Cooling	Forced Air (in front/out top)	
Heat Rejection		
(75kVA/60kW)	12,050 BTU/hr.	
(112.5kVA/90kW)	19,320 BTU/hr.	
Operating Altitude	Up to 1000m without Derating Load	
AC Output		
Output Voltages	120V (other voltages available; contact factory)	
Output Current (Nominal)		
(75kVA/60kW)	625A @ 120VAC	
(112.5kVA/90kW)	933A @ 120VAC	
Voltage Regulation	<±.5% Steady State for 0 to 100% Load Change	
Transient Response	<± 5% for a 100% Load Step <± 1% for a Loss/Return AC Input Power	
	<± 5% for Manual Transfer to Bypass and Back, 100% Load	
	<± 5% for a 100% Load Step	
Recovery	Return to within ± 2.5% of Nominal within 16 msec	
Voltage Distortion	Linear Loads: <± 3.5% @ 100% Load	
Overload	Up to 150% for 15 Min.	
Overload Static Bypass	>1000% for 1 Cycle	
Frequency	60 Hz (50 Hz Optional)	
Frequency Stability	±.1% Free Running	
Frequency Slew Rate	1.0 Hz/Sec. Maximum	
Weight	***75kVA***	***112.5kVA***
M1	4,600 lb. (2,087kg)	2,850 lb. (1,293kg)
M2	5,100 lb. (2,313kg)	7,710 lb. (3,497kg)
M3	5,400 lb. (2,449kg)	8,000 lb. (3,629kg)

Metering

THREE OPTIONS: POWERPAD 1, POWERPAD 2 AND POWERPAD 3 METERING VALUE (1% ACCURATE)

	METERING FEATURES	POWERPAD 1	POWERPAD 2	POWERPAD 3
Rectifier	Input Voltage (All Phase)	✔	✔	✔
	Input Current (All Phase)	✔	✔	✔
	Input Frequency		✔	✔
	Output Voltage (VDC)		✔	✔
	Output Current		✔	✔
Battery	Voltage (VDC)	✔	✔	✔
	Current	✔	✔	✔
	Runtime		✔	✔
	Time Remaining		✔	✔
	Power		✔	✔
	Cycles			✔
	Total Cycles			✔
	Test Cycles			✔
Inverter	Voltage (RMS)		✔	✔
	Current (RMS)		✔	✔
	Frequency		✔	✔
	Input Voltage (VDC)	Optional	Optional	Optional
Output	Voltage (RMS)	✔	✔	✔
	Current (RMS)	✔	✔	✔
	Frequency	✔	✔	✔
	Real Power (W)		✔	✔
	Apparent Power (VA)		✔	✔
	% Loading		✔	✔
	Crest Factor			✔
	Peak Current			✔
	Power Factor			✔
Alternate Line	Input Voltage	✔	✔	✔
	Input Frequency	✔	✔	✔

To order the CyberWave UPS, please contact your T&B sales representative.

UL®/NEMA Industrial UPS Systems

CyberWave Three-Phase UPS

Cyberex® offers a true online, double conversion three-phase output UPS system. It is developed to UL® standards as the optimal solution for applications in oil and gas, power generation and heavy manufacturing processes. Ranging from 10–150kVA, the CyberWave Three-Phase Series incorporates state-of-the-art system topology for higher online system efficiency and longer battery life. In addition, the CyberWave three-phase incorporates Cyberex's Digital Static Transfer Switch design for increased redundancy and reliability and an optimized battery charging technology. Designed for a 20-year life, the CyberWave Three-Phase Series features PWM inverter technology, DSP digital controls, parallel redundancy and rugged overload and fault clearing capabilities. Moreover, the CyberWave three-phase includes features no other UPS manufacturer can match, including superior diagnostics via user interface, fiber optic data paths for enhanced and accurate controls communication and full-color 8" x 6" touch screen user interface panel. For critical industrial applications, the CyberWave Three-Phase Series ensures increased system reliability and security that only can be attained by a true industrial uninterruptible power supply.

10kVA/8kW
20kVA/16kW
30kVA/24kW
40kVA/32kW
50kVA/40kW
60kVA/48kW
80kVA/64kW
100kVA/80kW
125kVA/100kW
150kVA/120kW

Features

- High online efficiency
- Lowest input THD reflected back to source
- IGBT-based PWM inverter
- Advanced Cyberex® Static Transfer Switch design
- Higher online efficiency
- Optimized battery-charging topology
- Flexible battery string configuration
- Input power factor near unity
- Superior diagnostics
- Digital Signal Processing (DSP)
- Full-color touch screen user interface
- Fiber optic data paths
- Full isolation – input/output transformer
- Event log downloadable via USB
- Standard harmonic mitigating output transformer
- Ambient temperature max. 50° C with 10% derating

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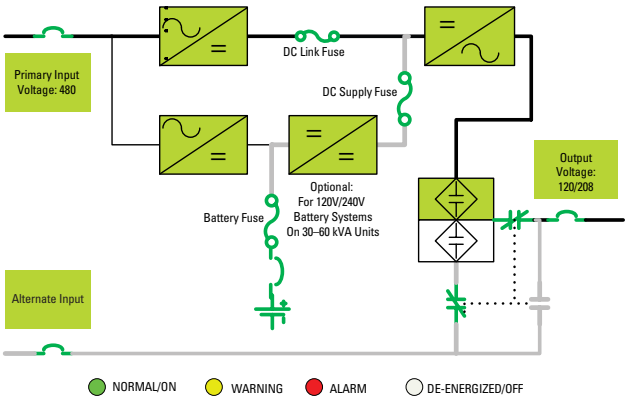
UL®/NEMA Industrial UPS Systems

Optional Features

- Isolated, parallel and cascade redundancy
- Blown fuse sensing
- Alternate input and output voltages
- 12-pulse rectifier with isolation transformer
- Double rated charger
- Waveform capture feature
- Bottom cable entry
- Protection up to NEMA Type 12
- Remote battery temperature sensing
- Custom colors

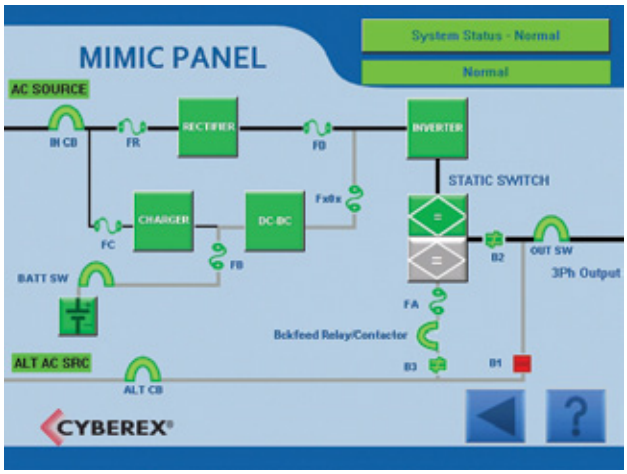
Hardware Configuration



Mimic/LED Indications

- Mains input
- Bypass input
- Load on bypass
- Charger status
- Inverter operation
- Load on inverter
- Synchronization/ bypass inverter
- Battery operations
- Battery discharge
- Battery MCCB
- Alarm indication

Mimic Display



Dimensions

KVA	H (IN.)	W (IN.)	D (IN.)	WEIGHT (LBS.)
10	81.5	50.3	34.4	1540
20	81.5	50.3	34.4	1650
30 (408VDC)	81.5	60.3	34.4	1850
30VDC	81.5	80.5	34.4	1900
40 (408VDC)	81.5	60.3	34.4	1960
40 (120 & 240VDC)	81.5	80.5	34.4	2400
50 (408VDC)	81.5	60.3	34.4	2620
50 (120 & 240VDC)	81.5	80.5	34.4	2700
60 (408VDC)	81.5	60.3	34.4	3000
60 (120 & 240VDC)	81.5	80.5	34.4	3500
80 (408VDC)	81.5	80.5	34.4	4100
80 (240VDC)	81.5	98.5	37	4100
100	81.5	98.5	37	4850
125	81.5	98.5	37	5200
150	81.5	98.5	37	5500

UL®/NEMA Industrial UPS Systems

Product Specifications

UPS Main Input	
Rectifier Voltage	480VAC, 3-Phase, 3W + G
Rectifier Voltage Range	-20% to +15%
Input Power Factor	.92 at Nominal Load
Current Total Harmonic Distortion (THDi)	28% or Better for 6-Pulse, 12% or Better for Optional 12-Pulse
Inrush Current	<150% Rectifier Soft Start (<5 sec.), w/Input Transformer (up to 300%) 1200% of Nominal Full Current Load for 100 ms on Input Transformer
Frequency	60 Hz
Frequency Range	±10% at Higher DC Bus
DC Bus/Circuit	
Voltage	120, 240 or 408VDC
Voltage Tolerance	±1% of Nominal Voltage
Float Voltage Range	100% – 120% of Nominal DC Output Voltage
Equalize (Boost) Voltage Range	100% – 130% of Nominal Output Voltage
Equalize Charge Time	8 – 10X Discharge Time
Charging Current Limitation	Programmable from 20% to 100% of Charger Capacity
UPS Output	
Nominal UPS Rating	kVA at pF .8
Voltage	277/480, 120/208
Voltage Regulation	
Steady State for 0 – 100%	±1%
Unbalanced Load for 0 – 100%	±3%
Dynamic at 100% Load Surge	±5% (return to ±1% within 25 msec)
Recovery Time	<25 msec
Phase Shift	
Balanced Load	120 deg. ± 1 deg.
Unbalanced Load	120 deg. ± 3 deg.
Voltage Distortion	
Linear Load	<5% at 100% Load
Non-Linear Load	<5% at 100% Load
Overload	
Inverter	200% for 200 msec 150% for 1 Min. 125% for 10 Min. 105% Continuous
Static Transfer Switch	1000% for 100 msec 200% for 1 Sec. 150% for 1 Min. 125% for 10 Min.
Nominal Frequency	
Free Running	<±.1%
Synchronization Range	Up to ±8% (selectable ±1% – ±8%)
Slew Rate	1 Hz/Sec.
System Efficiency	>89% w/o Input Transformer
Allowable Power Factor	.4 Lagging to .9 Leading
General Environment	
Ambient Temperature Range for Storage	-20° C – 70° C
Ambient Temperature Range for Operating	0° C – 40° C (to 50° C w/15% derate)
Relative Humidity	10 – 95% Non-Condensing
Operating Altitude	up to 1000m without Load Derating
Access	Front Only Access, No Rear or Side Access Required
Cooling	Forced Cooling with Redundant Fans
Noise Level	60 – 70 dBA Depending on Model
Degree of Protection	NEMA Type 1
Performance Test	IEC 62040-3
Safety	Designed to be UL® 1778, 4th Edition Compliant
EMC	FCC Part 15 Subpart J Class A
Enclosure Color	ANSI 61 Gray

Metering

- **Digital – LC Display**
- **Voltage Meters**
  - Input (Mains)
  - Rectifier
  - Alternate
  - Battery
  - Inverter
  - Load
- **Frequency Meters**
  - Mains
  - Alternate
  - Inverter
- **With True RMS Measurement**
- **Current Meters**
  - Input (Mains)
  - Battery
  - Inverter
  - Load
- **Power Meters**
  - Total kVA
  - Total kW
  - Total Power Factor
  - UPS kVA
  - UPS kW
  - UPS Power Factor

Alarms

Standard Alarms	
Input	Under Voltage
	Over Voltage
DC	Over Voltage
Battery	Discharging
	Under Voltage
	End of Battery Discharge
Inverter	Under Voltage
	Over Voltage
	IGBT Limb Fault
	Overload
	Overload Trip (inverse time)
	Over Temperature
Alternate	Under Voltage
	Over Voltage
	Frequency out of Range
Static Sw	Transfer to Bypass

System Ratings

UPS RATING (KVA)	BATTERY VOLTAGE (VDC) 120	240	408
10	✔	—	—
20	✔	—	—
30	✔	✔	✔
40	✔	✔	✔
50	✔	✔	✔
60	✔	✔	✔
80	—	✔	✔
100	—	—	✔
125	—	—	✔
150	—	—	✔

To order the CyberWave Three-Phase UPS, please contact your T&B sales representative.

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IEC Industrial UPS Systems

CyberWave UPS CI Series

Cyberex® offers a true online, double conversion UPS system. It is developed to IEC standards as an optimal and cost-effective solution for applications in oil and gas, power generation and heavy manufacturing processes. Ranging from 10–160kVA, the CyberWave CI Series incorporates state-of-the-art system topology for increased system efficiency and battery life. Designed for a 20-year life, these systems feature PWM inverter technology, DSP digital controls, parallel redundancy and rugged overload and fault clearing capabilities. In addition, the CI Series includes fiber optic data paths for enhanced and accurate controls and communication, an input and output isolation transformer and a fully rated, rugged static transfer switch. For critical industrial applications, the CI Series ensures increased system reliability and security that only comes from having truly uninterruptible power.

Features

- IEC 62040 compliant; ideal for international applications
- IGBT-based PWM inverter; digital signal processor for accurate and reliable controls
- Input power factor near unity at full loads with reducing reflected harmonics
- Single-phase fully rated static switch for increased reliability and security
- Internal communication facilitates high-speed CAN bus for improved signal transfer between processors
- High-speed branch fuse clearing design provides enhanced fault-clearing capability
- Input and output isolation transformer provides continuous, clean and regulated power without external effects
- Monitoring via LAN through SNMP or Modbus communication for accurate system analysis

10kVA/8kW
20kVA/16kW
30kVA/24kW
40kVA/32kW
60kVA/48kW
80kVA/64kW
100kVA/80kW
120kVA/96kW
140kVA/112kW
160kVA/128kW

Hardware Configuration

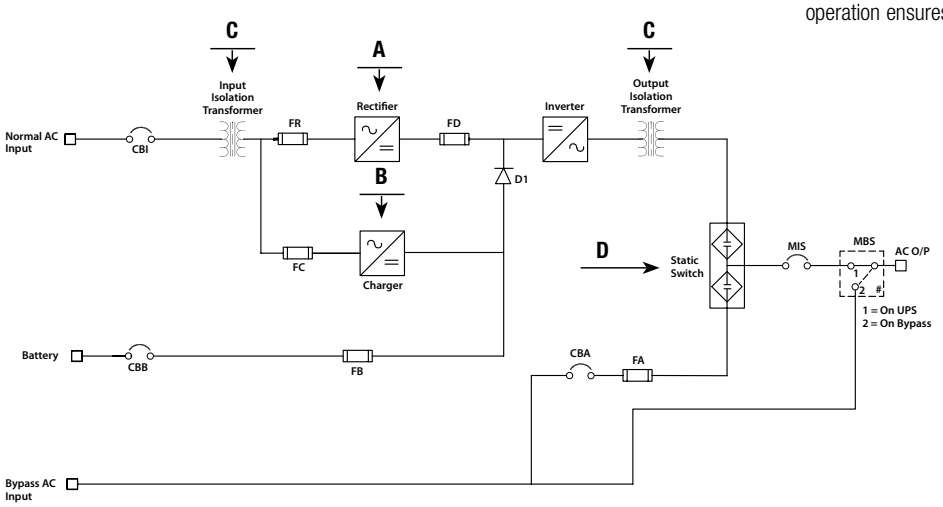
Hardware Configuration Key

A Unregulated bus enables flexible battery string configurations and low reflected harmonics

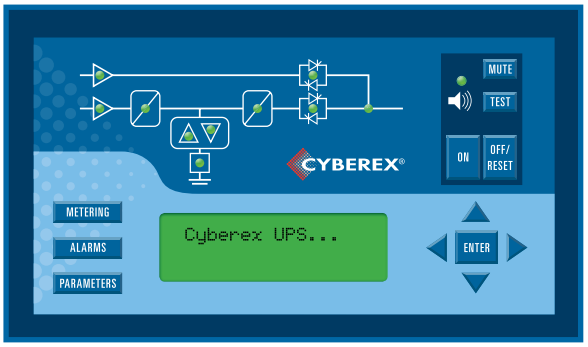
B Separate battery charger reduces ripple on battery for increased battery life and efficiency

C Input and output isolation transformer for maximum reliability

D Fully rated static switch for increased redundancy and reliability — make-before-break operation ensures no load droop



Mimic Display



Mimic/LED Indications

- Mains Input
- Bypass Input
- Load on bypass
- Charger status
- Inverter operation
- Load on inverter
- Synchronization/ bypass inverter
- Battery operations
- Battery discharge
- Battery MCCB
- Alarm indication

Options

- Parallel or hot standby redundancy
- Input isolation transformer
- Bypass line regulator
- AC distribution panel
- PC-based monitoring and recording unit
- RS-485 communication port
- Monitoring on LAN through SNMP
- Monitoring on LAN through Profibus
- Battery monitoring system
- Remote annunciator
- Automatic shutdown kit
- DCS connectivity through Modbus/Profibus
- Individual battery health monitoring systems (BHMS)
- IGBT-based rectifier (<5% THDI)
- 12-pulse rectifier for input harmonic reduction (<10)
- Harmonic filter (5th, 7th, 11th and 13th)

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IEC Industrial UPS Systems

Product Specifications

Main Input	
Voltage	415VAC (Std), 480VAC (optional)
Voltage Range	+15–20% at Full Load +15–25% at 75% Load
Phase	3-Phase, 3-Wire
Frequency	50 Hz (standard) 60 Hz (optional)
Frequency Range	±6%
Input Power Factor	>.95 at Full Load
Input Current Harmonics	<28% at Full Load
DC Bus Charger	
Voltage	110, 120, 220, 240, 360
Maximum DC Bus Ripple without Battery	< 2% RMS 100% Load
Maximum DC Bus Ripple with Battery	< 1% RMS 100% Load
Output	
Nominal Voltage	220/230/240V (standard) 110/115/120V (optional)
Load Power Factor Rated	.80
DC – AC Efficiency	92%
Load Crest Factor	3:1
Voltage Regulation Steady State	±1%
100% Step Load	±5%
Recovery Time	<20 msec return to 98.9% nominal voltage
Overload	125% 10 minutes • 150% 1 minute
Fault Clearing Capability	Fast acting fuse (4 msec)
Bypass Synchronization Window	±1% to 6% Field Programmable
Internal Oscillator	±.1%
Slew Rate	1 Hz/Sec
Total Harmonic Distortion Linear Load	<3%
Nonlinear Load (Crest Factor 3:1)	<5%
Frequency	50 Hz (standard) • 60 Hz (optional)
Operating Conditions	
Ambient Temperature	0–45° C
Altitude	up to 1000 Meters from MSL
Humidity	90% Non-Condensing
Audible Noise @	55–75 dBA at 1 meter (model dependent)
Enclosure	
Construction	CRCA Steel Sheet
Protection Class	IP21 (standard) • IP31, IP41 (optional)
Finish (Powder Coated)	RAL 7032 (other colors optional)
Ventilation	Forced Air (internal fans)
Cable Entry	Bottom (top optional)

Dimensions

kVA	Width	Depth	Height	Weight
10	1870mm 6.1 ft.	750mm 2.46 ft.	1800mm 5.90 ft.	700kg 1540 lb.
20	2630mm 8.6 ft.	750mm 2.46 ft.	1900mm 6.23 ft.	750kg 1650 lb.
30	2630mm 8.6 ft.	850mm 2.79 ft.	2000mm 6.56 ft.	1100kg 2420 lb.
40	2900mm 9.5 ft.	850mm 2.79 ft.	2000mm 6.56 ft.	1500kg 3300 lb.
60	3700mm 12.1 ft.	1000mm 3.28 ft.	2000mm 6.56 ft.	1600kg 3520 lb.
80	3900mm 12.8 ft.	1000mm 3.28 ft.	2000mm 6.56 ft.	2000kg 4400 lb.
100	3900mm 12.80 ft.	950mm 3.12 ft.	2000mm 6.56 ft.	2100kg 4630 lb.
120	3900mm 12.80 ft.	1050mm 3.44 ft.	2000mm 6.56 ft.	2250kg 4960 lb.
140	4200mm 13.78 ft.	1050mm 3.44 ft.	2000mm 6.56 ft.	2400kg 5291 lb.
160	4200mm 13.78 ft.	1050mm 3.44 ft.	2000mm 6.6 ft.	2600kg 5732 lb.

** Dimensions are for PR systems.*

Metering

Meters – Digital – LC Display		Metering with True RMS Measurement	
VOLTAGE METERS	Input (Mains)	**CURRENT METERS**	Input (Mains)
	Alternate		Battery
	Battery		Inverter
	Inverter		Load
	Load		
FREQUENCY METERS	Mains	**POWER METERS**	Total KVA
	Alternate		Total KW
	Inverter		Total Power Factor
			UPS KVA
			UPS KW
			UPS Power Factor

MAJOR ALARMS	TEXT READOUT	LC DISPLAY
INPUT	Under Voltage	Input Low
	Over Voltage	Input High
DC	Over Voltage	High DC Shutdown
BATTERY	Discharging	Bat. Discharge
	Under Voltage	Low Battery
	End of Battery Discharge	Low Battery Trip
INVERTER	Under Voltage	Inv. Low
	Over Voltage	Inv. High
	IGBT Limb Fault	Inv. Sat Trip
	Overload	Overload
	Overload Trip (Inverse Time)	Inv. Over LD Trip
	Over Temperature	Inv. Over Temp
ALTERNATE	Under Voltage	Alt. Low
	Over Voltage	Alt. High
	Frequency Out of Range	Alt. FO
STATIC SW	Transfer to Bypass	Load on Bypass

System Ratings

BATTERY VOLTAGE (VDC)	110	125	220	250 & 260	360
UPS Rating (kVA)	10	10	10	10	—
	15	15	15	15	—
	20	20	20	20	—
	30	30	30	30	—
	40	40	40	40	—
	—	—	50	50	—
	—	—	60	60	—
	—	—	80	80	—
	—	—	100	100	—
	—	—	—	—	120
	—	—	—	—	160

Higher ratings and other voltages available on request.

To order the CyberWave UPS, please contact your T&B sales representative.

Float Battery Chargers

CyberWave RBE II — Three-Phase or Single-Phase (Analog)

CyberWave RBE II industrial float chargers are designed to automatically control charging rates for a wide variety of battery types and to simultaneously provide full-rated output for both continuous and intermittent DC loads. The chargers are constant voltage devices with automatic current limiting. Voltage regulation and current limiting are controlled by solid-state integrated circuitry to ensure maximum performance in minimum space. The CyberWave RBE II is ideally suited to utility, communications and other stationary charger applications.

Computer & Control Systems
Utility & General Industry
Communications & Telecomm

Design Features

Component Selection

- Electronic and electrical components are substantially derated to ensure long life and reliability. Typical MTBF is 100,000 hours minimum. Components are selected or designed to provide a system life expectancy in excess of 30 years.

Modular Construction

- Control circuits, alarm circuits and electrical sub-assemblies are printed circuit board wired or modularized with plug and socket connections for easy serviceability.

Standard Sub-Assemblies

- Control modules and many electrical sub-assemblies are standardized across the entire range of charger sizes. This minimizes spare parts inventory and simplifies maintenance.

Durable

- Front panels are recessed to prevent accidental damage to meters and controls. Standard cabinets are NEMA 1 enclosures of heavy-gauge phosphatized steel with an attractive, long-lasting acrylic enamel finish.

Easy Troubleshooting

- A complete service manual, color-coded wiring, test-point identification and circuit-symbol labeling of internal components make troubleshooting easy.

Ease of Adjustment

- Tap adjustments are not required. Output float voltage, equalize voltage, current limit and alarm levels are potentiometer adjustable.

Ease of Access

- Internal components and connections are easily accessible and/or removable through a hinged front door that opens approximately 180 degrees for easy serviceability.

Ease of Installation

- Cabinets are floor, wall or rack mountable and equipped with knockouts for cable or conduit entrance. Input, output and remote alarm connections are wired to easily accessible, internal terminal blocks.

Random Parallel Operation

- RBE II Series Chargers may be random parallel operated with other chargers of similar regulation and current limit characteristics. Equal load sharing by two chargers requires the addition of the forced load sharing option.

Battery Eliminator Operation

- RBE II Series Chargers will operate as DC power supplies without batteries. Addition of the filtered battery eliminator option will reduce ripple, when used as a battery eliminator, to the greater of .06% or 30mV.

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Float Battery Chargers

Standard Features

- AC on indicating light
- AC input circuit breaker
- DC output fuses
- AC and DC surge suppressors
- DC output ammeter and voltmeter
- Manual float/equalize switch
- Float and equalize adjustment potentiometers
- Current limit adjustment potentiometer
- DC output blocking diode
- DC output protection diode
- Color-coded internal wiring

Typical internal construction detail showing combined alarm-status charger monitor option.

Options and Accessories

- Alarm relays for remote indication
- CASM — combined alarm status monitor
- DC ground detection for local indication
- Equalize timers
- AC fuse
- DC circuit breaker
- Forced load sharing
- High DC voltage charger shutdown
- Filtered battery eliminator
- Input lightning arrestors
- Surge withstand capability
- AC input voltmeter and/or ammeter

Product Specifications

AC Input	
Voltage	Single-Phase: 120/220, 480 or 120/208 Three-Phase: 208, 380 or 480V
Input Voltage Tolerance	+10%, –12%
Frequency	60 Hz
Input Frequency Tolerance	±5%
Efficiency	89–93% (typical at 130VDC)
DC Output	
Voltage Ratings	12, 24, 48, 130 or 260VDC Nominal
Current Ratings	16–600ADC (Three-Phase) 6–100ADC (Single-Phase)
DC Output	±.5% with Input Line Variations ±1.0% against the Combined Variations of Line, Load and Temperature
Output Transient	±5.0% with 20–100% Step Load Change
Response & Recovery	Response & Recovery Recovery to ± 2.0% of DC Voltage within 200 msec Recovery to Steady State DC Voltage within 500 msec
Output Current Limit	110% of Rated Load, Adjustable from 90% to 120% of Rated Load
Output Ripple and Electrical Noise*	Unfiltered: <3% RMS (Three-Phase) <1% RMS (Single-Phase) Filtered: <3% mVrms
** Measured when connected to a battery with an 8-hour, Amp-Hour rating of four times the full load current rating of the charger.*	
Environmental	
Operating Ambient Temperature	0° C to 50° C
Storage Temperature	-40° C to 85° C
Operating Altitude	Up to 1000 Meters without Derating
Relative Humidity	5% to 95% (without condensation)
Audible Noise	< 65 dBA at 5 ft.
Ventilation	6–300ADC: Convection Cooling 400–600ADC: Force Cooling
Heat Loss	70–23,600 BTU/hr.
Size	18.25"–58"W 15"–80"H 12.125"–30"D
Weight	80–1,950 lbs.

SCR Battery Charger DC Output Table

VDC NOMINAL	FLOAT ADJUSTMENT RANGE (VDC)	EQUALIZE ADJUSTMENT RANGE (VDC)	ADC SIZE CELL AVAILABLE (1)		LEAD-ACID CELL CAPABILITY (2) (NO. OF CELLS)		NI-CAD CELL CAPABILITY (3) (NO. OF CELLS)	
			1Ø INPUT	3Ø INPUT	NORMAL	REDUCED VPC	NORMAL	REDUCED VPC
12	10.5–14.5	11.3–16	6 to 100	60 to 100	5–6		8–10	
24	23–30	24.5–32	6 to 100	50 to 600	11–13		17–20	21
48	46–60	48–64	6 to 100	50 to 600	22–26	27	34–40	42
130	115–140	124–150	6 to 50	25 to 600	55–62	63	86–94	98
260	230–280	245–300	6 to 25	16 to 300	110–124	126	172–188	196

(1) The discrete ADC sizes offered within the ranges listed above are 6, 12, 16, 20, 25, 30, 35, 40, 50, 60, 75, 100, 125, 150, 175, 200, 250, 300, 400, 500, 600ADC. All sizes are rated at 100% load. Some current ratings are not available on certain chargers. Consult factory or current price list for exact offerings.

(2) Based on Lead-Acid Float of 2.15 to 2.25V/Cell and equalize of 2.25 to 2.4V/Cell.

(3) Based on Ni-Cad Float of 1.35 to 1.45V/Cell and Equalize of 1.50 to 1.60V/Cell.

To order the CyberWave RBE II, please contact your T&B sales representative.

Float Battery Chargers

CyberWave RBE II — Three-Phase or Single-Phase (Digital)

Design Features

Modular Construction

- Rectifier, microprocessor control, input/output, power transformer, filter and alarm assemblies are all modular and easily replaceable

30-Year Life

- All chargers are engineered for greater than 30-year life with a MTBF of 100,000 hours

Trouble Diagnosis: Less than 60 Minutes

- Trouble diagnosis and repair in an MTTR of less than 60 minutes
- All service can be performed from front of opened unit without disturbing chassis or installed conduit

Flexible Installation

- All chargers can be floor mounted
- Chargers in Style 5018 enclosure can be wall or rack mounted

Fast, Online Adjustment

- Control, alarm and operating level set points are adjusted digitally from the front panel while on line, without the need to vary loads or external conditions

Engineered for Safety and Acceptance

- The battery charger is designed and tested for worldwide applications
  - Meets NEMA PE 5-1996 specification for utility-type battery charger
  - NEMA 1/IP20 type standard enclosure
  - Meets FCC requirements for part 15 subclass J class A
- Agency approvals (for models in Style 5018 and Style 5030 enclosures only):
  - CSA C22.2 Certified
  - Complies with UL® 1012 battery charger and UL 1564 power supply specifications via CSA-NRTL/C listing
  - CE/IEC Compliant
  - Seismic Zone 4 qualified Style 5018 enclosure

Power Generation
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Microwave Relay Sites
Switchgear
Emergency DC Power
DC Operated Breakers
Alarm Systems
Uninterruptible Power Systems
DC Control Systems
Signal Systems

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Float Battery Chargers

Standard Features

- 1% digital LED meter for VDC, ADC, timer hours and alarm settings
- AC On indicating light
- AC input and DC output circuit breakers
- Float/equalize selector switch with indicating light
- Manual equalize timer (0–255 hr.) with indicating light
- AC line failure automatic equalize timer (0–255 hr.) with indicating light
- Self diagnostics
- Local or remote voltage sense with redundancy to protect against remote sense failure
- High DC voltage shutdown (HVSD)
- Reverse polarity protection
- Front panel controls can be disabled for security
- MOV surge suppressors, input and output
- Cu/Al I/O compression lugs
- Switchboard insulation system number-coded wiring
- Membrane front panel
- ANSI 61 epoxy powder coat finish
- Alarm assembly with local LEDs and summary relay contact for AC failure, DC failure, high VDC, low VDC, positive and negative ground fault
- Redundant analog circuit for summary alarm operates on low DC voltage, independent of microprocessor
- Custom parts data package and production test data reports shipped with each unit
- User-friendly operating manual with standard drawings
- Quick setup sheet

Options and Accessories

Three-Phase and Single-Phase

- DC output filter per NEMA PE5 1996: 30 mVrms with battery (12/24/48VDC), 100 mVrms with battery (130VDC)
- Battery eliminator filter
- Medium or high AIC circuit breakers
- AC input lightning arrestor
- Fungus proofing (tropicalization)
- Static proofing
- Enclosure drip shield
- External temperature compensation (tempco) via remote probe
- Relay rack mounting (Style 5018 only)
- Padlock with hasp for front panel door
- Cabinet heater assembly
- NEMA 4/12 type enclosure with fan

Three-Phase Only

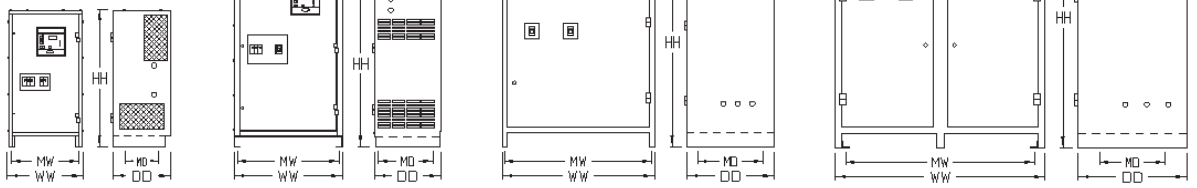
- Auxiliary alarm relay PC board (two form C contacts for all alarms, solderless compression terminals, contact rating is .5A @ 125VAC/VDC, accepting #22– #14 AWG wire)
- Copper ground pad (with Cu/Al compression lug)
- Wall mounting (Style 5018 only)
- Communications module for DNP3 Level 2 or Modbus protocols
- Forced load-sharing module (for two units of identical rating only)
- Analog AC ammeter
- Analog AC voltmeter
- Zero-center ground detection meter
- End-of-discharge alarm
- Battery-discharge alarm
- Custom drawing package with optional CAD and PDF files
- ABS certification upon request

Single-Phase Only

- Individual alarm contacts for each of the alarms
- Ground pad with #4 AWG lug
- Floor stand

ENCLOSURE DIMENSIONS

CABINET STYLE		5018	5030	163	198
Overall Dimensions (mm)	HH	37.95 (964)	54.25 (1378)	62.00 (1575)	80.00 (2032)
	WW	20.90 (531)	30.00 (762)	42.00 (1067)	58.00 (1473)
	DD	16.77 (426)	19.14 (486)	24.00 (610)	30.00 (762)
Mounting Dimensions (mm)	MW	18.50 (470)	27.90 (710)	40.00 (1016)	52.00 (1321)
	MD	9.00 (229)	15.00 (381)	18.00 (457)	18.00 (457)



Style 5018 *Style 5030* *Style 163* *Style 198*

Float Battery Chargers

Options and Accessories for Microprocessor Control Battery Charger

- Lightning arrester
- Medium interrupting capacity circuit breakers
- High interrupting capacity circuit breakers
- Temperature compensation
- Drip shield
- NEMA 4/12/13 enclosure
- Cabinet heater
- Padlock for front panel
- Standard output filtering
- Battery eliminator filtering
- Auxiliary relay PC board
- Ground pad
- Fungus proofing
- Forced load sharing
- Rackmount brackets
- Communications option

Product Specifications

AC Input	
Voltage	102, 208, 240, 480 or 550VAC, 60 Hz; 220, 380 or 415VAC, 50/60 Hz
Input Voltage Tolerance	+10%, -12%
Input Frequency Tolerance	±5%
Power Factor	.80 Typical Full Load
Efficiency	89–93% (typical at 130VDC)
DC Output	
Voltage Ratings	12, 24, 48 or 130VDC Nominal
Current Ratings	25–1000ADC (three-phase) 6–100ADC (single-phase)
Continous Ratings	110% Rated Current at Maximum Equalized Voltage of 50° C
Voltage Regulation	± .25% for Line, Load, Frequency and Temperature Variations
Electrical Noise/Ripple	30mVrms, 32 dBrnC Weighted Maximum on Filtered Units
Surge Withstand Capability	Meets IEEE 472/ANSI C37.90a
Environmental	
Operating Ambient	32° F to 122° F (0° C to 50° C) Temperature without Derating
Operating Altitude	3300 ft. (1000m) above Sea Level without Derating
Relative Humidity	5% to 95% (without condensation)
Audible Noise	Less than 65 dBA at Any Point 5 ft. (1.5m) from Any Vertical Surface of Enclosure

To order the CyberWave RBE II, please contact your T&B sales representative.

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Standalone Inverter Systems

CyberWave ISS

CyberWave ISS, the world's first digitally controlled Inverter/Static Switch System for custom applications, combines Cyberex's hallmark rugged electrical design with the versatility of digital signal processors, field-programmable gate arrays and EPROM's to set a new standard in ISS performance and reliability for industrial applications.

CyberWave ISS has standard features no other ISS manufacturer can match, including real-time voltage harmonic control and the world's first VGA, full-color touch-screen 8" x 11" control panel (PowerPad). In addition, every CyberWave ISS incorporates Cyberex's patented Digital Static Transfer Switch design for increased system redundancy and reliability.

Features

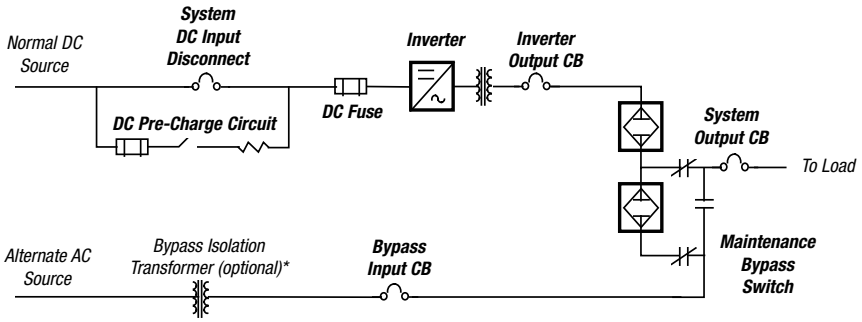
- IGBT-based PWM inverter
- Full digital controls with DSPs
- Full isolation output transformer
- Full-color touch-screen monitor panel
- RS-232 communications port
- Bidirectional fully rated static switch
- Maintenance bypass switch
- Fiber optic datapaths
- Surface-mount PCB technology

Inverter

Isolation Transformer

Hardware Configuration Summary

	INPUT			INVERTER					BYPASS			SYSTEM		
	DC INPUT BREAKER (NON-AUTO)	INPUT FUSE	INPUT PRE-CHARGE CIRCUIT	INVERTER INPUT CB (NON-AUTO)	IGBT PWM INVERTER (<5% VTHD FOR CF=3)	INTERNAL IGBT FUSES	INVERTER OUTPUT ISOLATION TRANSFORMER	INVERTER OUTPUT CB (NON-AUTO)	BYPASS CB	BYPASS ISOLATION TRANSFORMER	BYPASS VOLTAGE REGULATOR	MAINTENANCE BYPASS SWITCH	STATIC SWITCH: FULLY RATED, BI-DIRECTIONAL	SYSTEM OUTPUT CB (NON-AUTO)
M1	X	X	X		X	X	X			0	0	X	X	
M2	X	X	X		X	X	X		X	0	0	X	X	X
M3	X	X	X	X	X	X	X	X	X	0	0	X	X	X



** When alternate line transformer is needed, Cyberex recommends an M2 or M3 configuration*

Standalone Inverter Systems

Product Specifications

METERING		P1	P2	P3
INPUT	DC Input Voltage (A, B, C)	◆	◆	◆
	DC Input Current (A, B, C)	◆	◆	◆
INVERTER	Voltage (RMS)		◆	◆
	Current (RMS)		◆	◆
	Frequency		◆	◆
OUTPUT	Voltage (RMS)	◆	◆	◆
	Current (RMS)	◆	◆	◆
	Frequency	◆	◆	◆
	Real Power (W)		◆	◆
	Apparent Power (VA)		◆	◆
	% Loading		◆	◆
	Crest Factor			◆
	Power Factor			◆
	Line Phase Difference			◆
ALTERNATE LINE	Input Voltage	◆	◆	◆
	Input Frequency		◆	◆
NUMBER OF METERS		7	13	16

EVENTS/ALARMS	PARAMETERS	P1	P2	P3
INPUT	DC Input CB Open	Optional	Optional	Optional
	DC Input Fuse Blown	Optional	Optional	Optional
	DC Bus OK	◆	◆	◆
	DC Ground Fault Positive		◆	◆
	DC Ground Fault Negative		◆	◆
	DC Input Available/Failure			Optional
	DC Input Voltage High/Low			Optional
	DC Input Current High		Optional	Optional
INVERTER	OK	◆	◆	◆
	Failure	◆	◆	◆
	Overload	◆	◆	◆
	Current Limit	◆	◆	◆
	Sat Trip Event	◆	◆	◆
	Overtemp	◆	◆	◆
	Output Voltage High			◆
	Output Voltage Low			◆
	Output Frequency High			◆
	Output Frequency Low			◆
	Input CB Open	Optional	Optional	Optional
	Output CB Open	Optional	Optional	Optional
	Input Fuse Blown	Optional	Optional	Optional
BYPASS	Alternate Line OK	◆	◆	◆
	Alternate Line Fail	◆	◆	◆
	Sync Loss	◆	◆	◆
	STS on Alternate	◆	◆	◆
	STS on Preferred	◆	◆	◆
	Alt Line CB Open	Optional	Optional	Optional
OUTPUT	Load on Inverter	◆	◆	◆
	Load on Bypass	◆	◆	◆
	STS on Preferred	◆	◆	◆
	STS on Bypass	◆	◆	◆
	Output to Ground Fault			◆
	Output Failure			◆
	MBS in Normal Position	◆	◆	◆
	MBS in Bypass	◆	◆	◆
	MBS in Bypass Isolate	◆	◆	◆
	STS Output CB Open	Optional	Optional	Optional
	Emergency Power OFF			Optional
GENERAL	Inverter/Rectifier Normal	◆	◆	◆
	MBS Position	◆	◆	◆
	Summary Alarm	◆	◆	◆
	Fan Failure		◆	◆
	Cabinet Overtemperature	◆	◆	◆
OTHER	Event Log	◆	◆	◆
	STS Test		◆	◆
	Mimic Panel			◆

ENVIRONMENTAL SPECIFICATIONS	
Acoustical Noise Level	Less Than 60dBA at 3 Feet
Operating Temperature	0–40° C, 0–50° C Optional
Relative Humidity	0–95% Non-Condensing
Access	No Rear or Side Access Required for Operation or Maintenance
Cooling	Forced Air; Optional Redundant Fan Assemblies
Operating Altitude	Up to 1000m with No Derating Load
Standard Paint	Light Gray ANSI 61 Option: Cyberex White
DC Input Rating	
DC Voltage	Standard 240VDC, 120VDC Optional
Input Voltage	Nominal Voltage +10% and -20%
AC Output Rating	
Inverter Power	Rated at 0.8 Power Factor
Voltage	120V, 240V Optional (International Voltages Available)
Voltage Adjustability	+5% of Nominal
Voltage Regulation	< +1.5% Steady State for 0–100% Load Change
Transient Response	< +5% for a 100% Load Step < +1% for Loss or Return of AC Input Power < +5% for Manual Transfer to Bypass and Back @ 100% Load
Voltage Recovery	Return to within +2.5% of Nominal Value within 16 Milliseconds (One Cycle)
Voltage Distortion	Linear Loads: <2% at Full Load Non-Linear Loads (Crest Factor = 3:1): Max 5% at Full Load
Overload: Inverter	Up to 150% of Rated Output Power for 15 Minutes at Min. DC Bus and Input Voltage at 40° C Up to 150% of Rated Output Power for 5 Minutes at 50° C
Overload: Static Bypass	10–20kVA: 1193A RMS Symmetrical with XL/R = 15 for One Loop 25–30kVA: 1491A RMS Symmetrical with XL/R = 15 for One Loop 40–75kVA: 5321A RMS Symmetrical with XL/R = 15 for One Loop
Frequency	60 Hz Nominal, 50 Hz Optional
Frequency Stability	+.1% Free Running
Frequency Slew Rate	1.0 Hz/Sec. Maximum
Product Standards	
UL® 1778, ETL, CSA, CE & Seismic Zone 4 Compliances Available	
FCC Part 15 Subpart J Class A Compliant	
Year 2000 Compliant	
In Accordance with NEMA and IEC Product Standards	

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Standalone Digital Static Transfer Switches

Digital Static Transfer Switch

Cyberex's single-phase standalone Digital Static Transfer Switch (DSTS) increases overall electrical system reliability by adding redundancy where it counts most — at the point of use. This single-phase standalone DSTS is ideal for rugged industrial applications such as oil platforms, petro-chemical processing applications and power generation plants. It features Modbus communications for remote monitoring of alarms, system status and setpoints enabling users to select the standalone DSTS preferred source from a host computer.

Backed by Cyberex's 40-year history of single-phase DSTS design, this standalone DSTS features an exclusive solid-state design for longevity and reliability.

Features

- SuperSwitch design
- ¼ cycle break-before-make transfers
- Redundant logic and gate drive power supplies
- CMOS logic and DSP implementation for high-speed sensing and transfers
- Rugged, high-reliability SCR devices eliminate potential mechanical failures
- Internal fiber optics for high reliability
- Integral maintenance bypass
- Redundant fans
- Modbus RS-232 communications

Options

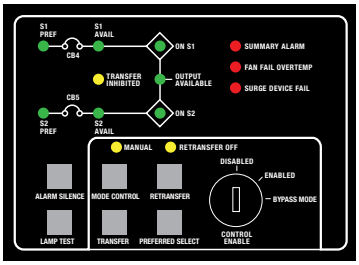
- Remote setpoint adjustments
- Operating temperature up to 50° C
- Various service access
- Enhanced enclosure

100A
200A
400A
600A
800A

Standalone Digital Static Transfer Switches

Product Specifications

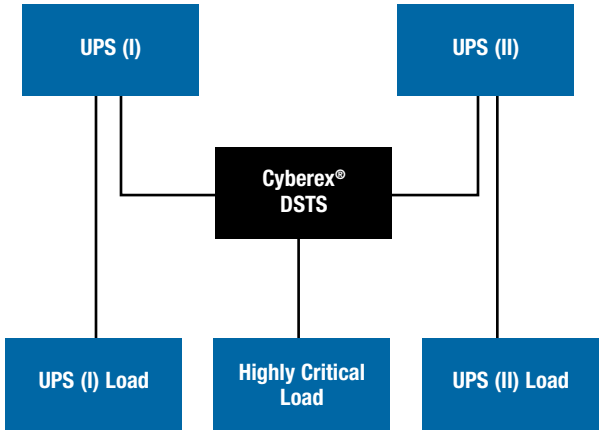
Electrical Characteristics	
Ampacity	100–800A
Voltage	120VAC
Interrupt Rating	65A
# Poles	1-Pole
Frequency	60 Hz
Operational Characteristics	
Transfer	Automatic or Manual
Auto Transfer	4 ms (or less)
Controls	Preferred Select Transfer: 2 ms Retransfer Control Alarm Silence Mode Control
Temperature	0–40° C
Humidity	0–95% Non-Condensing
Audible Noise	< 50 dBA at 1 Meter
Alarm Relays (Programmable)	Source 1 Source 2 Manual Mode Auto Re-Transfer Off Critical Alarm Summary Alarm
User Interface	
Status Indicators	***Indicators (LEDs)***
Source 1 (Available)	Source 1 (Preferred)
Source 1 (Preferred)	Source 2 (Preferred)
Source 2 (Available)	On Source 1
Source 2 (Preferred)	On Source 2
On Source 1	Source 1 (Available)
On Source 2	Source 2 (Available)
Output Available	Output Available Re-Transfer Off Source 2 (Preferred) Manual Mode Active Fan Failure Transfer Inhibited Summary Alarm
Alarms	
Fan Fail	Shorted SCR Source 1
Over-Temperature	Shorted SCR Source 2
Manual Mode	Transfer Inhibited
Auto Retransfer Off	Source 1 Unavailable
Surge Device Fail	Source 2 Unavailable
Output Unavailable	Loss of Internal Comm.
Open SCR Source 1	Critical Alarm
Open SCR Source 2	Summary Alarm
Standards	
NEMA (All Applicable Standards)	
Designed to UL® 1008	



Mimic Display

Front View Showing
Hinged Access Panels

Typical Applications



Ordering Information

CAT. NO.	AMPS	VOLTS	DIM. (W x D x H)	WEIGHT
DSF0-10100-126-120-6N065	100A	120V	25" x 34" x 77"	1000 lbs.
DSF0-10200-126-120-6N065	200A	120V	25" x 34" x 77"	1200 lbs.
DSF0-1400-126-120-6N065	400A	120V	25" x 34"x 77"	1400 lbs.
DSF0-10600-126-120-6N065	600A	120V	25" x 34" x 77"	1500 lbs.
DSF0-10800-126-120-6N065	800A	120V	37" x 34"x 77"	1600 lbs.

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Power Distribution Systems

100–400A Industrial Distribution Module

Today's industrial applications require the most technologically advanced support systems to ensure state-of-the-art power quality needs. The Cyberex® IDM provides the flexibility to expand your industrial distribution needs. Fed from your existing redundant UPS system, the IDM readily provides up to two 42-circuit output panelboards.

Features

- Industrial design includes switches, fuse and blown fuse indication for rugged application
- Easy maintenance access enables low mean time to repair (MTTR), minimizing critical load interruption
- Wall or floor mounted
- Spacious cable management for frequent wiring changes
- Top or bottom power feed entry simplifies installation for existing facility architecture
- System monitoring includes a relay for blown fuse indicator
- Compact footprint maximizes valuable real estate

Product Specifications

Electrical	
Ampacity	100–400A
Input/Output Voltage	120/120VAC (contact factory for other variations)
Input/Output Phase	1-Phase, 2-Wire + G
Frequency	60 Hz
Type	Fused Switches or Breakers
Panel-boards	Up to (2) 42-Circuit Output
Input Breaker	Up to (2) Input Breakers
Indication	Blown Fuse Indicators (Relay)
Subfeed Breakers Available	Contact Factory
Operating Conditions	
Temperature (Operating)	0° to 40° C
Temperature (Storage)	-40° to 60° C
Maximum Operating Altitude	8,200 ft. (2,500m)
Access	Front Access Only – Wall Mounted
Cooling	Natural Convection Cooling
Dimensions/Weight	
1 Panelboard	**2 Panelboards**
Height 51" (129.54cm)	Height 80" (203.2cm)
Depth 10.5" (26.67cm)	Depth 10.5" (26.67cm
Width 30" (76.2cm)	Width 60" (152.4cm)
Weight 250 lb. (113.40kg)	Weight 600 lb. (272.16kg)
General	
Hinged Dead Front Panel	
Single Point Ground	
Branch Circuit Breaker or Fused Switches	
Optional Additional Fuse on Hot Side	
Optional Circuit Monitoring	
Optional Transient Voltage Surge Suppression	
Communications	
Modbus 485	
Standards	
NEMA (All Applicable Standards)	
FCC Compliant (Part 15)	

Power Distribution Systems

Catalog Numbering System

A – Panelboard Quantity*	
1	1 Panelboard
2	2 Panelboards
B – Monitoring	
L0	No Monitoring
L1	Main Voltage Indicator
L2	Blown Fuse Indicator
C – Amperage*	
100	100A
200	200A
225	225A
400	400A
D – Input/Output Voltage*	
1	120VAC
E – Frequency*	
6	60 Hz

** Other variations available — please contact factory.*

Model Example:

IDM 1 - L0 - 100 - 1 - 6
A B C D E

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